

CLAIMS

1. A method of operating a computer to perform an engineering change decision analysis of an engineering design change in a product, comprising:

displaying a list of change drivers that is driving the engineering design change and receiving a selection of a change driver from a user;

displaying a set of questions soliciting general cost information associated with the engineering design change;

displaying a set of questions soliciting change driver-specific information associated with the selected change driver;

receiving answers to the set of general cost questions from the user;

receiving answers to the set of change driver-specific questions from the user;

computing a cost associated with the engineering design change using the general cost answers;

computing a value associated with not implementing the engineering design change using the change driver-specific answers; and

comparing the computed cost and value and generating a recommendation of whether the engineering design change should be implemented in response to the comparison.

2. The method, as set forth in claim 1, wherein computing the cost associated with the engineering design change comprises:

computing a cost variance associated with warranty of the product manufactured with the engineering design change;

computing a cost variance associated with producing the product manufactured with the engineering design change; and

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summing the warranty cost variance with the production cost.

5 3. The method, as set forth in claim 2, wherein computing a cost variance associated with warranty comprises:

computing a first cost variance associated with warranty of the product manufactured with the engineering design change and underwent product verification testing;

10 computing a second cost variance associated with warranty of the product manufactured with the engineering design change and without undergoing product verification testing;

15 selecting an optimum from the first and second cost variances.

20 4. The method, as set forth in claim 2, wherein computing a cost variance associated with producing the product comprises:

computing a first cost variance associated with assembly of the product with the engineering design change;

25 computing a second cost variance associated with tooling to produce the product with the engineering design change; and

summing the first and second cost variances.

30 5. The method, as set forth in claim 1, wherein displaying a set of general cost questions and receiving answers thereto comprise displaying a question requesting for highest, best, and lowest warranty variance estimates for product warranty of the product manufactured with the engineering design change, and respective probabilities, and receiving answers thereto.

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6. The method, as set forth in claim 5, wherein displaying a set of general cost questions and receiving answers thereto comprise displaying questions and receiving answers for the highest, best, and lowest product warranty variance estimates associated with the product manufactured without product verification testing, and respective probabilities.

7. The method, as set forth in claim 1, wherein displaying a set of general cost questions and receiving answers thereto comprise displaying a question requesting for highest, best, and lowest assembly cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities, and receiving answers thereto.

8. The method, as set forth in claim 1, wherein displaying a set of general cost questions and receiving answers thereto comprise displaying a question requesting for highest, best, and lowest tooling cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities, and receiving answers thereto.

9. The method, as set forth in claim 1, wherein displaying a set of general cost questions and receiving answers thereto comprise displaying a question requesting for highest, best, and lowest incremental piece cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities, and receiving answers thereto.

10. The method, as set forth in claim 1, wherein displaying a list of change drivers comprises displaying a list including management directed, customer

satisfaction, quality, cost, feasibility, and missed objective change drivers.

5 11. The method, as set forth in claim 1, wherein displaying a set of questions soliciting change driver-specific information comprises displaying a question requesting whether a required condition will be met by implementing the late engineering design change.

10 12. The method, as set forth in claim 1, wherein displaying a set of questions soliciting change driver-specific information comprises displaying a question requesting highest, best, and lowest warranty variance estimates for work on the product without the engineering design change.

15 13. The method, as set forth in claim 1, wherein displaying a set of questions soliciting change driver-specific information comprises displaying a question requesting a percentage of customers who purchase the product despite the lack of implementing the engineering design change.

20 14. A method of operating a computer to perform an engineering change decision analysis of an engineering design change in a product, comprising:

receiving a selection of a change driver that is driving the engineering design change;

25 receiving general cost information associated with the engineering design change;

30 receiving change driver-specific information associated with the selected change driver;

computing a cost associated with the engineering design change using the general cost information;

computing a value associated with not implementing the engineering design change using the change driver-specific information; and

5 comparing the computed cost and value and generating a recommendation of whether the engineering design change should be implemented in response to the comparison.

15. The method, as set forth in claim 14, further comprising:

10 receiving an identification of specific data in the general cost information or the change driver-specific information to vary;

varying the specific data; and

15 comparing the computed cost and value and generating an output in response to varying the specific data.

16. The method, as set forth in claim 14, wherein receiving general cost information comprises receiving highest, best, and lowest warranty variance estimates for product warranty of the product manufactured with the engineering design change, and respective probabilities.

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17. The method, as set forth in claim 16, wherein receiving general cost information comprises receiving the highest, best, and lowest product warranty variance estimates associated with the product manufactured without product verification testing, and respective probabilities.

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18. The method, as set forth in claim 14, wherein receiving general cost question comprises receiving highest, best, and lowest assembly cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities.

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19. The method, as set forth in claim 14, wherein receiving general cost questions comprises receiving highest, best, and lowest tooling cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities.

20. The method, as set forth in claim 14, wherein receiving general cost questions comprises receiving highest, best, and lowest incremental piece cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities.

21. The method, as set forth in claim 14, wherein receiving the selection of the change driver comprises receiving the selection from among management directed, customer satisfaction, quality, cost, feasibility, and missed objective change drivers.

22. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving an indication of whether a required condition will be met by implementing the late engineering design change.

23. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving highest, best, and lowest warranty variance estimates for work on the product without the engineering design change.

24. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving a percentage for customers who purchase the product despite the lack of implementing the engineering design change.

25. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving a percentage for customers who purchase the product manufactured without engineering design change and correct the product on warranty.

26. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving a probability for addressing feasibility issues by changing assembly process, and by adding manpower and assembly time, instead of implementing the engineering design change.

27. The method, as set forth in claim 14, wherein receiving change driver-specific information comprises receiving information on lost production due to feasibility issues and not implementing the engineering design change.

28. The method, as set forth in claim 14, wherein computing the cost associated with the engineering design change comprises:

computing a cost variance associated with warranty of the product manufactured with the engineering design change;

computing a cost variance associated with producing the product manufactured with the engineering design change; and

summing the warranty cost variance with the production cost.

29. The method, as set forth in claim 28, wherein computing a cost variance associated with warranty comprises:

computing a first cost variance associated with warranty of the product manufactured with the engineering design change and underwent product verification testing;

5 computing a second cost variance associated with warranty of the product manufactured with the engineering design change and without undergoing product verification testing;

selecting an optimum from the first and second cost variances.

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30. The method, as set forth in claim 28, wherein computing a cost variance associated with producing the product comprises:

15 computing a first cost variance associated with assembly of the product with the engineering design change;

computing a second cost variance associated with tooling to produce the product with the engineering design change; and

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summing the first and second cost variances.

31. A computer-implemented engineering change decision analysis system for analyzing an engineering design change in a product, comprising:

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a graphical user interface operating on a computer to receive a selection of a change driver that is driving the engineering design change, general cost information associated with the engineering design change, and change driver-specific information associated with the selected change driver;

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an analysis logic program operating the computer to compute a cost associated with the engineering design change using the general cost information, a value associated with not implementing the engineering design change using the change driver-specific information, and compare the computed cost and value and generate a

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recommendation of whether the engineering design change should be implemented in response to the comparison.

5 32. The system, as set forth in claim 31, wherein the graphical user interface operable to receive an identification of specific data in the general cost information or the change driver-specific information to vary, and the analysis logic program operating the computer to vary the specific data, and compare the
10 computed cost and value and generating an output in response to varying the specific data.

15 33. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive general cost information comprising highest, best, and lowest warranty variance estimates for product warranty of the product manufactured with the engineering design change, and respective probabilities.

20 34. The system, as set forth in claim 33, wherein the graphical user interface is operable to receive general cost information comprising the highest, best, and lowest product warranty variance estimates associated with the product manufactured without product
25 verification testing, and respective probabilities.

30 35. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive general cost information comprising highest, best, and lowest assembly cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities.

35 36. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive general cost information comprising highest, best, and

lowest tooling cost variance estimates for manufacturing the product with the engineering design change, and respective probabilities.

5 37. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive general cost information comprising highest, best, and lowest incremental piece cost variance estimates for manufacturing the product with the engineering design
10 change, and respective probabilities.

15 38. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive the selection of the change driver comprising a selection from among management directed, customer satisfaction, quality, cost, feasibility, and missed objective change drivers.

20 39. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive change driver-specific information comprising an indication of whether a required condition will be met by implementing the late engineering design change, and wherein the analysis logic program generating a
25 recommendation of not implementing the engineering design change in response to the indication that the required condition will not be met.

30 40. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive change driver-specific information comprising highest, best, and lowest warranty variance estimates for work on the product without the engineering design change.

35 41. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive

change driver-specific information comprising a percentage for customers who purchase the product despite the lack of implementing the engineering design change.

5 42. The system, as set forth in claim 31, wherein the graphical user interface is operable to receive change driver-specific information comprising a probability for addressing feasibility issues by changing assembly process, and by adding manpower and assembly
10 time, instead of implementing the engineering design change.

15 43. The system, as set forth in claim 31, wherein the analysis logic program further computes a cost variance associated with warranty of the product manufactured with the engineering design change, a cost variance associated with producing the product manufactured with the engineering design change, and
20 summing the warranty cost variance with the production cost.

25 44. The system, as set forth in claim 43, wherein the analysis logic program further computes a first cost variance associated with warranty of the product manufactured with the engineering design change and underwent product verification testing, a second cost variance associated with warranty of the product manufactured with the engineering design change and without undergoing product verification testing, and
30 selecting an optimum from the first and second cost variances.

35 45. The system, as set forth in claim 43, wherein the analysis logic program further computes a first cost variance associated with assembly of the product with the engineering design change, a second cost variance

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associated with tooling to produce the product with the engineering design change, and summing the first and second cost variances.